

IN THE CLAIMS:

1. (Currently Amended) A medical instrument holding device capable of holding a medical instrument having a long member to be inserted into the interior of a subject, comprising:

a grasping member having a longitudinal shaft and to be grasped by an operator,

a holding portion provided on the grasping member and capable of holding the medical instrument so as to extend the long member in a direction different from that of the longitudinal shaft of the grasping member,

a ball joint element arranged above or below the axis of the longitudinal shaft of the grasping member and connected to the grasping portion,

an arm portion having a movable free end, [[and]]

a ball joint acceptant portion supporting the ball joint element provided on the free end of the arm portion in a ball joint manner, and

a shaft member which connects a structure comprising the medical instrument and the grasping member to the ball joint element, the shaft member connecting the ball joint element and the structure on a substantially straight line connecting between a center of gravity G of the structure and a position P of a ball center of the ball joint element, wherein the substantially straight line connecting between the center of gravity G of the structure and the position P of the ball center of the ball joint element extends in a direction different from the longitudinal shaft of the grasping member.

2. (Original) The medical instrument holding device according to claim 1, wherein the arm portion comprises:

a fixed portion fixed to a floor or operating table,
a connecting arm connected to the fixed portion,
an acceptant arm provided with the ball joint element or the ball joint acceptant portion,
a plurality of link arms connected to the connecting arm and the acceptant arm via articulations, and
a counter weight provided on at least one of the plurality of link arms so that the balance of moment of rotation produced at the ball joint element or the ball joint acceptant portion provided on the acceptant arm is maintained when the medical instrument is held on the holding portion.

3. (Cancelled)

4. (Original) The medical instrument holding device according to claim 2, wherein the device further comprises a braking portion provided in the articulations of the arm portion and between the ball joint element and the ball joint acceptant portion to switch the articulations as well as the ball joint element and the ball joint acceptant portion into a fixed condition and a free condition.

5. (Original) The medical instrument holding device according to claim 4, wherein the braking portion comprises electro-magnetic brakes and a controller which controls the electro-magnetic brakes, and

the grasping portion is provided with a switch which instructs the fixed condition or free condition of the braking portion to the controller.

6. (Currently Amended) The medical instrument holding device according to claim 1, wherein ~~one end in the longitudinal direction of the grasping portion has an inserting shaft portion having an L-shaped crank form is connected to the grasping portion, and the proximal end of the medical instrument is connected the one end~~ to provide a space in the longitudinal direction.

7. (Cancelled)

8. (Currently Amended) A medical instrument holding device capable of holding a medical instrument having a long member to be inserted into the interior of a subject, comprising: ~~The medical instrument holding device according to claim 1, which further comprising:~~

a grasping member having a longitudinal shaft and to be grasped by an operator,

a holding portion provided on the grasping member and capable of holding the medical instrument so as to extend the long member in a direction different from that of the longitudinal shaft of the grasping member,

a ball joint element arranged above or below the axis of the longitudinal shaft of the grasping member and connected to the grasping portion,

an arm portion having a movable free end,

a ball joint acceptant portion supporting the ball joint element provided on the free end of the arm portion in a ball joint manner,

an attitude detector provided in the grasping member and comprising a pointing portion pointing the vertical direction and a detecting portion rotatably supporting the pointing portion to detect a tilted angle,

a U-shaped member pivotally supporting the grasping member,
a shaft journaled by the U-shaped member and provided with a connecting bar
which is detachably fitted in the grasping member,
a motor provided at one end of the shaft to rotate the shaft, and
a control means for controlling the rotation of the motor on the basis of
detected results by the attitude detector.

9. (Original) The medical instrument holding device according to claim 1,
wherein the longitudinal direction is substantially at right angles to an insertion direction
which coincides with an axial direction of the long member.

10. (Currently Amended) ~~The medical instrument holding device according to
claim 1;~~ A medical instrument holding device capable of holding various medical instruments
having a long member to be inserted into the interior of a subject, comprising:

a grasping member having a longitudinal shaft, whose center of gravity is
changed by movement of a grasping position,

a holding portion provided on the grasping member and capable of
exchangeably holding the various medical instruments, along the longitudinal shaft, so as to
extend the long member in a direction different from that of the longitudinal shaft of the
grasping member,

a ball joint element arranged above or below the axis of the longitudinal shaft
of the grasping member and connected to the grasping portion,

an arm portion having a movable free end,

a ball joint acceptant portion supporting the ball joint element provided on the
free end of the arm portion in a ball joint manner, and

a shaft member which connects a structure constituted of a medical instrument held by the holding portion and the grasping member to the ball joint element,

wherein when the medical instrument held by the holding portion is exchanged for another medical instrument, the shaft member connects a structure comprising said another medical instrument and the grasping member to the ball joint element along a line connecting a gravity G of a structure constituted of [[the]] said another medical instrument and the grasping member, whose grasping position has been moved to adjust the center of gravity, to the position P of the ball center of the ball joint element, and the line is substantially parallel to an insertion direction which coincides with an axial direction of the long member.

11. (New) An endoscope holding device capable of holding an insertion portion for an endoscope having a long member to be inserted into the interior of a subject, comprising:

a first optical system contained in the insertion portion a guide an optical image of an object of observation,

a grasping member which is connected to the insertion portion, contains an image pickup element and a second optical system that forms an optical image guided from the first optical system on the image pickup element, has a longitudinal shaft and is to be grasped by an operator,

a ball joint element arranged above or below the axis of the longitudinal shaft of the grasping member and connected to the grasping portion,

an arm portion having a movable free end,

a ball joint acceptant portion supporting the ball joint element provided on the free end of the arm portion in a ball joint manner, and

a shaft member which connects a structure comprising the insertion portion for an endoscope and the grasping member to the ball joint element, the shaft member connecting the ball joint element and the structure on a substantially straight line connecting between a center of gravity G of the structure and a position P of a ball center of the ball joint element.

12. (New) A medical instrument holding device comprising:

a medical instrument having a long member to be inserted into the interior of a subject and a grasping member having a longitudinal shaft and to be grasped by an operator, the long member extending in a direction different from that of the longitudinal shaft of the grasping member,

a ball joint element arranged above or below the axis of the longitudinal shaft of the grasping member,

an arm portion having a movable free end,

a ball joint acceptant portion supporting the ball joint element provided on the free end of the arm portion in a ball joint manner, and

a shaft member which connects the medical instrument to the ball joint element, the shaft member connecting the ball joint element and the medical instrument on a substantially straight line connecting between a center of gravity G of the medical instrument and a position P of a ball center of the ball joint element, wherein the substantially straight line connecting between the center of gravity G and the position P of the ball center extends in a direction different from the longitudinal shaft of the grasping member.

13. (New) The medical instrument holding device according to claim 12, wherein the arm portion comprises:

- a fixed portion fixed to a floor or operating table,
- a connecting arm connected to the fixed portion,
- an acceptant arm provided with the ball joint element or the ball joint acceptant portion,
- a plurality of link arms connected to the connecting arm and the acceptant arm via articulations, and
- a counter weight provided on at least one of the plurality of link arms so that the balance of moment of rotation produced at the ball joint element or the ball joint acceptant portion provided on the acceptant arm is maintained when the medical instrument is connected to the ball joint element.

14. (New) The medical instrument holding device according to claim 13, wherein the device further comprises a braking portion provided in the articulations of the arm portion and between the ball joint element and the ball joint acceptant portion to switch the articulations as well as the ball joint element and the ball joint acceptant portion into a fixed condition and a free condition.

15. (New) The medical instrument holding device according to claim 14, wherein the braking portion comprises electro-magnetic brakes and a controller which controls the electro-magnetic brakes, and

the grasping portion is provided with a switch which instructs the fixed condition or free condition of the braking portion to the controller.

16. (New) The medical instrument holding device according to claim 12, further comprising a connecting member which is capable of moving the grasping member and the ball joint element in the longitudinal direction of the grasping member.

17. (New) The medical instrument holding device according to claim 12, further comprising:

an attitude detector provided in the grasping member and comprising a pointing portion pointing the vertical direction and a detecting portion rotatably supporting the pointing portion to detect a tilted angle,

a U-shaped member pivotally supporting the grasping member,

a shaft journaled by the U-shaped member and provided with a connecting bar which is detachably fitted in the grasping member,

a motor provided at one end of the shaft to rotate the shaft, and

a control means for controlling the rotation of the motor on the basis of detected results by the attitude detector.

18. (New) The medical instrument holding device according to claim 12, wherein the longitudinal direction is substantially at right angles to an insertion direction which coincides with an axial direction of the long member.

19. (New) The medical instrument holding device according to claim 12, wherein a line connecting a gravity G of a structure comprising the medical instrument and the grasping member to the position P of the ball center of the ball joint element is substantially parallel to an insertion direction which coincides with an axial direction of the long member.